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DISCRIMINATION AGAINST INDIGENOUS PEOPLES

Transnational Investments and Operations on the Lands of Indigenous Peoples

Report of the United Nations Centre on Transnational Corporations pursuant to Sub-Commission resolution 1990/26

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Introduction

1. In the report of its seventh session in 1989, the Working Group on Indigenous Populations recommended that the United Nations Centre on Transnational Corporations (UNCTC) assist the Working Group "in preparing a database on transnational investments and operations on indigenous people's lands and territories, and in particular those lands which are currently in dispute" (E/CN.4/Sub.2/1989/36, annex I). The Sub-Commission on Prevention of Discrimination and Protection of Minorities endorsed this recommendation in its resolution 1989/35 of 1 September 1989.

2. Following technical consultations with the United Nations Centre on Human Rights, the UNCTC proposed a methodology for this database, and for future annual reports to the Working Group, including a draft questionnaire (E/CN.4/Sub.2/AC.4/1990/6). The Working Group expressed its appreciation to the UNCTC, decided to include the questionnaire as an annex to the report of its eighth session, encouraged all parties to provide the UNCTC with the requested information, and invited the UNCTC to report to its ninth session (E/CN.4/Sub.2/1990/42, annex I). Sub-Commission resolution 1990/26 of 31 August 1990 reaffirmed this decision of the Working Group.

3. This is the second annual report of the UNCTC to the Working Group on Indigenous Populations in accordance with the mandate contained in Sub-Commission resolutions 1989/35 and 1990/26.

A. Methodology

4. A questionnaire on "Transnational Investments and Operations on the Lands of Indigenous Peoples" was explained to participants at the eighth session of the Working Group on Indigenous Populations, and a copy was annexed to the report of the session (E/CN.4/Sub.2/1990/42, annex VII). It was decided to conduct the survey on TNC activities first in the Americas and afterwards in Africa and Asia. The actual work is being carried out by the staff of the UNCTC and student interns from the American Indian Studies Department of the University of Washington. Copies of the questionnaire were mailed to (a) indigenous organizations which had registered at previous sessions of the Working Group, (b) organizations listed by the Inter-American Indian Institute as national indigenous organizations, and (c) Indian tribes and Alaska Native entities identified by the Government of the United States. This initial distribution of the questionnaire reached more than 500 organizations and communities in nearly 40 countries. Approximately half of the organizations and communities contacted are located in the United States, however, because more detailed lists of tribal, regional and national indigenous organizations were available.

5. Follow-up letters were sent to all communities and organizations which had not responded to the UNCTC within six months. In addition, an effort was made to contact each national indigenous organization in Latin America by telephone in April and May 1991. The objectives and methods of the study were discussed with them in detail, and they were encouraged to express any concerns they may have had about responding to the questionnaire. Comments received as a result of these follow-up contacts are considered in the final section of this report.

6. Twenty-two questionnaires were received from indigenous organizations in the United States, two from Panama, and one each from Bolivia, Chile, Costa Rica, Myanmar and Venezuela. Fifteen North American respondents are indicated on Map 1. The names shown are those of the organizations that responded, and may be different from the indigenous peoples to which they belong.

7. To supplement the information obtained from these questionnaires, the UNCTC has reviewed a wide variety of secondary sources, including specialized publications (America Indigena, IWGIA* Newsletter, Cultural Survival Quarterly) as well as professional journals in the fields of anthropology, development economics, ecology and mining. A number of useful technical reports were also provided, at the request of the UNCTC, by the Environmental Division of the World Bank, by various United States Government departments and by the Natural Resource Defense Council.

8. The geographic scope and level of detail of this second report are clearly limited by the nature and quantity of the data received by the UNCTC. For this reason, it was considered inappropriate to prepare a tabular summary of all of the responses to the questionnaire that have been received thus far. Instead, responses to the questionnaire have been used as a source of illustrations and case studies, together with the information obtained from published materials. These examples are useful but not necessarily representative of all indigenous peoples (see Map 1 for responses).

9. Readers of this second report are encouraged to direct questions, corrections and supplementary information to Lorraine Ruffing, UNCTC, United Nations, Room DC2-1244, New York, NY 10017, or via telefax (212) 963-2146. All indigenous organizations that received the questionnaire are encouraged to return it.

B. Distribution of indigenous peoples

10. The World Bank and United Nations bodies have made references to a global indigenous population of 200-300 million. 1/ No comprehensive demographic tables or maps have been published thus far in the United Nations system. One of the priorities of this study will be to establish reliable baseline information on the number, distribution and land areas of indigenous peoples in all geographic regions.

11. This second report provides a general overview of the distribution of indigenous peoples of the Americas, and their spatial relationship to some areas of particular economic significance (fisheries, forests, minerals). Maps and statistics should be regarded as preliminary, and are subject to revision in the next report.

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* International Workgroup for Indigenous Affairs.

12. Map 2 shows the distinctly indigenous areas of North America, on the basis of information from the Inter-American Indian Institute, the National Atlas of Canada and Statistics Canada, and the United States Department of Commerce, Census Bureau. Shaded areas represent the following:

(a) In the contiguous United States, "Indian reservations" (lands set aside for indigenous people but which are not necessarily owned or occupied exclusively by them). About one third of the indigenous people in the contiguous United States live on reservations;

(b) In Alaska and northern Canada, census districts in which 40 per cent or more of the total population is indigenous, regardless of the status of land ownership;

(c) In southern Canada, Indian reserves with a population of over 1,000 are indicated by single dots; none are large enough to show to scale;

(d) In Guatemala, areas in which indigenous people comprise more than 60 per cent of the total population;

(e) Elsewhere in Central America, areas identified as distinctly indigenous in publications or reports of the respective Governments.

C. Land-use areas

13. It should be noted that the population density of the indigenous areas of Alaska and northern Canada is very low (1 per 100 square km or less), and settlements are separated by hundreds of kilometres. Indigenous people nevertheless continue to hunt and fish throughout this northern region. Such subsistence activities play a vital role in indigenous economies, social structure and culture. Without access to land, indigenous peoples cannot maintain their subsistence activities and their way of life. The United States and Canada have assumed ownership of most of this land under various land-claims settlements, giving the indigenous inhabitants small demarcated lands for their exclusive use (reservations), and subsistence harvesting rights on other lands. Map 3 shows the current status of land-claims settlements in Canada. Most of the north is now covered by agreements, although selections of land to be reserved for indigenous people have thus far been made only in the Cree (Quebec) and Inuvialuit areas. The total area secured for indigenous people in accordance with these agreements will be 229,000 square miles (586,000 square km), or about 15 per cent of the region as a whole, including 32,960 square miles of subsurface rights.

14. Recent land-claims settlements in the United States were settled through a special land-claims court which usually gave cash awards or income per capita settlements. There are several exceptions to this procedure. The Alaskan Native Claims Settlement Act (1971) terminated all aboriginal claims and rights, including hunting and fishing rights, in exchange for native rights to fee-simple title of about 44 million acres and a shared cash settlement of $962 million. It represented 10 per cent of the land for nearly 20 per cent of the people who actually laid claims to nearly 100 per cent of the land.

However, many indigenous people in Alaska do not recognize the legality of the 1971 legislation. The Passamaquaddy and the Penobscot Indians of Maine went to court for the violation of the Non-Intercourse Act (1790), which stated that no one could buy or take lands from Indians without official United States approval, and were awarded $80 million in cash. The Passamaquaddy used one third of the settlement to purchase 300,000 acres of timber land.

15. Land disputes continue in the United States. The Western Shoshone are pressing claims to several million acres taken from them in 1863 by an act of Congress. The Lakota Sioux have thus far refused to accept more than $100 million in court-awarded compensation for the Black Hills, a sacred area expropriated by Congress in 1874 after gold was discovered. The Colville tribes still claim the right to harvest wildlife on 4 million acres (1.6 million hectares) surrounding their reservation, and the Coos are trying to recover forest lands lost when their tribe was dissolved by Congress in 1954.

16. Map 4 shows the distinctly indigenous areas of South America. It is based on Government reports to the Inter-American Indian Institute, and, where available, independent scholarly sources. Lighter shading in Argentina, Guyana, Suriname and French Guiana indicates areas with widely dispersed indigenous settlements or interspersed indigenous and non-indigenous communities. Population density is relatively high in the Andean region, and relatively low in the Amazon basin. Much of these areas have not been officially demarcated and they are in constant danger of invasion (Colombia, where there has been a settlement and demarcation, is an exception).

17. Maps 5 through 8 indicate overlaps between distinctly indigenous areas and major mineral and forest resources. In North America many important hydrocarbon fields underlie United States Indian reservations and the distinctly indigenous parts of Alaska. Uranium deposits are located on several United States Indian reservations, and throughout the north central part of Canada. Lead-zinc deposits are found in distinctly indigenous areas of north central and northern Canada, and in Central America. Iron deposits are concentrated in the north-east (northern Quebec). A belt of boreal forests crosses Canada merging into broken forest and tundra in the north, and meeting temperate rain forests on the Pacific coast. Large parts of the boreal forest are hunted by indigenous peoples, and many small United States reservations and Canadian reserves are located in the coastal rain forest. Distinctly indigenous areas of Mexico, Guatemala, Honduras, Nicaragua and Panama are also located in rain forests.

18. In South America, agro-industry, logging, mining and oil development threaten both the rain forests and the survival of indigenous peoples in Brazil, Colombia, Ecuador, Peru and Venezuela. The dominant minerals in this region are tin, copper, silver and gold. Gold is also found in placer deposits throughout the headwaters of the Amazon River, along the north-western Brazilian frontier. Diamonds are found in southern Venezuela, and uranium in eastern Brazil. Attention is also drawn to the wide extent of indigenous areas in the Amazonian basin rain forest (Map 8). Mineral deposits are concentrated in distinctly indigenous areas of the Andes, especially in Peru and Bolivia (Map 8).

19. The population figures in Table 1 were drawn from various sources and should be regarded as preliminary. Statistics were obtained from national census reports in Canada (1986) and the United States (1990), and from estimates for circa 1978-1980 published by the Inter-American Indian Institute and Cultural Survival. No population data were found for Guyana, French Guiana, Suriname or Dominica, although indigenous people live in each of these countries.

Table 1

INDIGENOUS PEOPLE OF THE AMERICAS
(estimated totals and percentage of national population)

Country	Number (000)	Per cent
Canada*	711	3.0
United States	1 959	0.8
Mexico	8 042	12.0
Belize	24	-
Guatemala	3 739	60.0
El Salvador	5	-
Honduras	157	5.0
Nicaragua	76	4.0
Costa Rica	11	1.0
Panama	93	6.0
Venezuela	202	2.0
Colombia	547	2.0
Ecuador	2 564	34.0
Peru	6 025	37.0
Bolivia	3 526	59.0
Chile	616	6.0
Argentina	398	2.0
Paraguay	67	2.0
Brazil	243	-

From various sources: the United States Census Bureau, 1990; Statistics Canada, 1986; and Centre on International Research, 1980-1986.

* Counts exclude the data for all reserves that were not completely enumerated; approximately 140 out of 575 did not participate in the census.

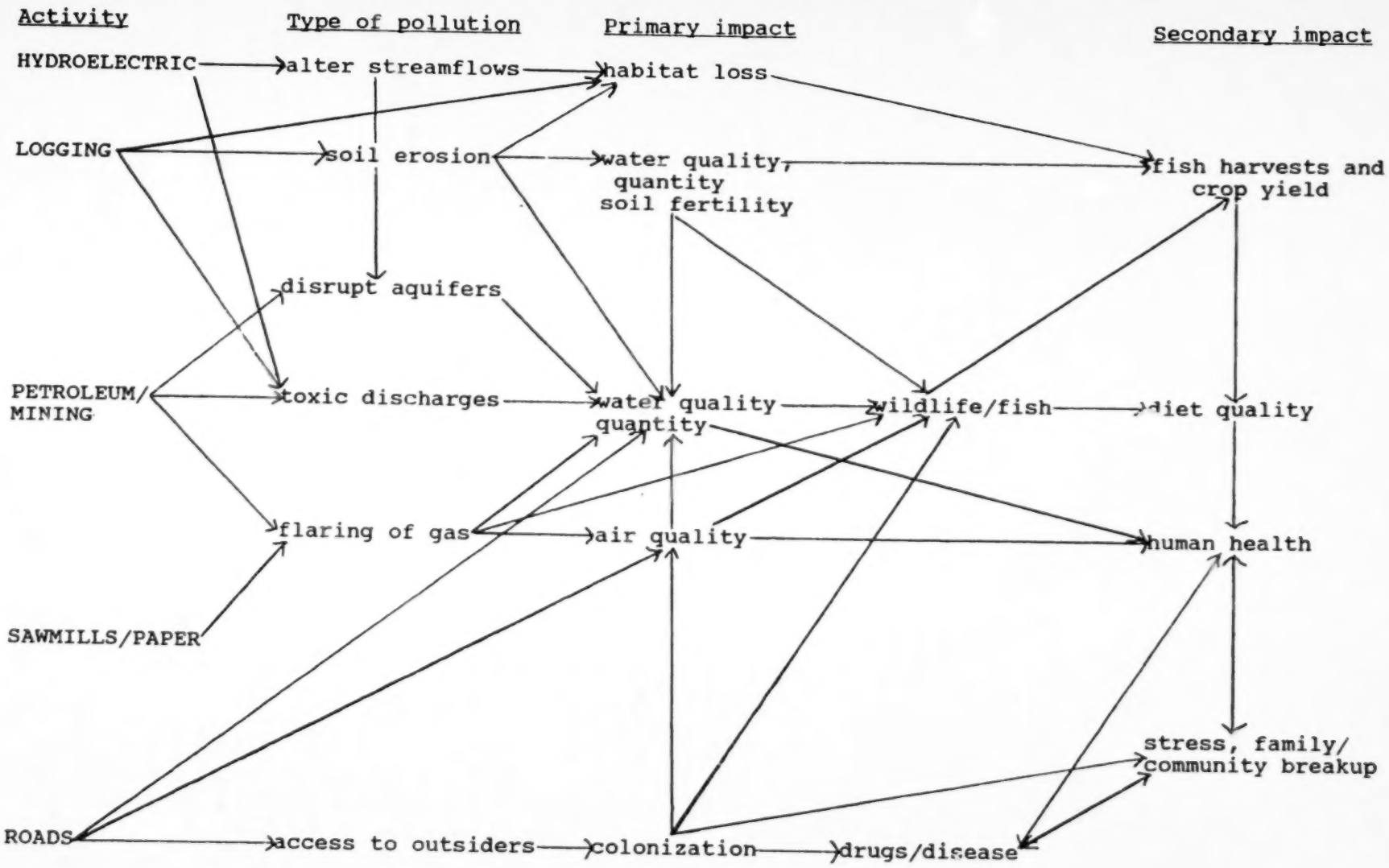
D. Socio-cultural impacts

20. The purpose of the project is to identify the impacts of the activities of transnational corporations on indigenous lands. In his exhaustive "Study of the Problem of Discrimination against Indigenous Populations" (E/CN.4/Sub.2/1986/1/Add.4) the Special Rapporteur of the Sub-Commission, Mr. José Martínez Cabo, suggested that the impacts of the exploitation of non-renewable natural resources on indigenous lands be seriously and urgently investigated. Large-scale projects in the primary sector are often carried out by transnational corporations. The annual reports of the Working Group on Indigenous Populations make frequent reference to the impacts of these projects. Land, including traditional-use areas, plays an important role in indigenous peoples' survival. Their subsistence activities, social structure and culture are largely dependent on it. Therefore, when activities of TNCs have an impact on indigenous lands, this affects more than just their indigenous economies. The special importance of land to indigenous peoples and the need to ensure indigenous peoples' direct role in decisions affecting their lands are recognized in International Labour Organisation Convention No. 169. Of course, non-indigenous peoples are also affected by the activities of TNCs; however, three distinctions must be made. First, the impacts are not always as far-reaching for non-indigenous peoples as for indigenous peoples. Non-indigenous peoples can relocate without losing their very identity. Second, non-indigenous peoples seldom have use rights which stretch back thousands of years. Lastly, large-scale projects bring both positive and negative impacts. Therefore, any investigation would have to look at the total costs and benefits from both a national and an indigenous point of view. This very detailed calculus will be undertaken in the individual case studies. It cannot be undertaken here for the 22 respondents because of space limitations.

21. Respondents to the UNCTC questionnaire reported a wide variety of adverse impacts of development projects in their territories. Table 2 summarizes the impacts associated with different kinds of development activities, based on questionnaire responses and secondary sources.

22. Like all other people, indigenous peoples are adversely affected by the physical destruction or contamination of air, soils and water. Indigenous peoples' economic organization and legal status make them particularly vulnerable to environmental damage. In most parts of the world, indigenous peoples still depend on wildlife and fisheries for a large part of their diet. For example, average household consumption of the Inupiat is 664 pounds of edible wildlife harvest and over one fourth of the families consumed more than 1,000 pounds. Indigenous cultivators and pastoralists are generally located in relatively fragile ecosystems, such as the arctic, deserts and the rain forests. As a result, indigenous economies depend on maintaining a high level of environmental quality. Indigenous peoples also lack the economic power and, in most countries, the legal rights to demand thorough assessments of projects before they are approved, and careful monitoring once they begin. Activities with significant risks are more likely to be sited on the lands of indigenous peoples, and are less likely to be supervised adequately, because of the remoteness of the areas.

Table 2. Characteristic impacts of five development activities on indigenous peoples



23. The loss of traditional subsistence activities results in greater reliance on wages, and on purchasing cheap carbohydrates such as wheat flour, rice and sugar. This reduces the quality (nutrient variety) of the diet and leads to poor health and higher mortality, particularly of infants and children. Health problems frequently associated with a loss of hunting and fishing include anaemia, vitamin A and C deficiency and low resistance to infectious diseases. Cardiovascular disease has increased several-fold in communities shifting from a diet of wildlife to carbohydrates. Possible links between dietary changes and diabetes melitis are being studied in Australia and Canada. Wildlife and fish continue to contribute to indigenous peoples' nutrition even in highly industrialized countries, and often make the difference between modest living standards and absolute poverty. 2/

24. Traditional subsistence activities more than supplement the wage economy. They also contribute to mental health by providing stability and cultural identity. Subsistence strengthens the family unit, provides meaningful work, and answers needs for personal self-reliance, self-esteem and fulfilment. Declining health, combined with the loss of subsistence activities, can result in stress, domestic violence, alcohol and drug abuse, and lead to the breakup of families and communities. This can be aggravated by government programmes to relocate or assimilate the people affected. Such programmes further reduce people's control over their own lives, leading to further stress, depression, and self-destructive behaviour. The destructive aspects of supervised change can be made far worse by involving missionaries as change agents, as frequently continues to be the case in Latin America. The long-term social and cultural consequences of the destruction of an indigenous economy is similar to the effects of a natural disaster. People lose stability, a supportive social environment, self-confidence and hope. They become "development refugees".

25. Employment in the construction and operation of the project is a way of offsetting, at least temporarily, its adverse economic effects on indigenous peoples. It can also assure a more equal division of the costs and the benefits of the project. However, many of the projects are capital-intensive and employ those with rather specific skills so that local communities rarely benefit in terms of being directly employed. Wage employment can accelerate the social and cultural impacts of the project, however. Dependence on wages changes the social structure of indigenous communities. It involves a loss of personal autonomy, so highly valued by indigenous people, and creates a competing system of responsibilities to the company rather than the community. It supplants the authority of community leaders and begins a process of socio-economic differentiation which results eventually in new cleavages based upon property, rather than kinship. Employment can also add to the psychological and cultural impacts of the loss of traditional subsistence activities. Employees may view themselves, or be regarded by kinsmen, as agents of the destruction of their own land and way of life. This creates spiritual and religious contradictions within the community.

26. The following is a brief review of the environmental, social and cultural impacts characteristic of each industrial sector. A number of respondents reported problems with air, soil or water quality as a result of petroleum

exploration and development. Degradation and disruption have been reported in two very different ecosystems, each of them fragile in its own way: the Arctic Slope of Alaska, and Amazonian Ecuador and Venezuela (see case study No. 2). The arctic ecosystem involves a relatively simple, and therefore relatively short trophic web. Primary production on land depends upon a thin mat of lichens and mosses. Construction of roads and gravel pads, disposal of toxic drilling muds and other wastes, and windblown toxic soot from the burning of waste oil and flaring of gas result in widespread degradation of the air, land and water. This reduces forage for herbivores such as caribou and moose, which are impacted further by road systems (caribou avoid them, disrupting migration, while moose are attracted, and killed in collisions). Rivers and streams are also interrupted by gravel mining and roads and this often strands whole runs of fish. Tundra ponds near waste pits have elevated levels of toxic metals and hydrocarbons compared with control ponds. There has been a decline in diversity and abundance of invertebrate species in these ponds. It is estimated that fish and wildlife lost 22,000 acres from gravel fill and excavation and blockage by roads, pipelines and causeways. The greatest recorded impact of the loss of habitat was the displacement of 22,500 birds. However, the number of caribou increased from 5,000 to 18,000 due to the decline in natural predators. 3/ This degradation was the result of "normal" oil development. It is important to mention that United States federal environmental laws and State laws usually require permits for discharges into the air, water and land. Numerous violations of these permits have been recorded and until 1983 there was no field staff to monitor impacts, compliance or follow-up violations. Responding to the UNCTC questionnaire, the Inupiat Community of the Arctic Slope reported a significant decrease in subsistence activity, and an overall loss of environmental quality. TNCs exploiting the Arctic Slope include Amoco, ARCO, Chevron, Conoco, Exxon, Gulf, Mobil, SOHIO, Standard Oil and Texaco, all of which are based in the United States, as well as firms with British (BP) and mixed (NL-UK) parentage (Shell).

27. The Amazonian rain forest ecosystem is also fragile, owing to the poor fertility of its soils. Primary production is restricted to the leafy canopy, which comprises only 2 per cent of total forest biomass. The remaining 98 per cent of forest biomass and available nutrients is locked up in the woody parts of the trees, which serve essentially as a platform for the leaves. Most animal species are also found in the canopy, not on the ground. Removal of the canopy therefore eliminates most of the habitat. Petroleum development in the Amazon begins with the removal of trees for seismic lines, test wells and access roads and airfields. Toxic wastes from wells, toxic soot from burning waste oil and gas, and spills of crude oil from pipelines contaminate surrounding vegetation and streams, and soil erosion results in flooding and wider deforestation. Fish die from toxins in the rivers and wildlife flee the area, depriving indigenous peoples of a large part of their food supply. Erosion and soil contamination may even render subsistence farming difficult. Twenty-two TNCs are producing or exploring for oil in the Ecuadorian Amazon. In addition to United States-origin TNCs such as ARCO, Conoco, Texaco and UNOCAL, petroleum development in the Amazon is being pursued by TNCs with Brazilian (Petrobras), Canadian (PetroCanada) and French (ELF-Aquitaine) parentage. 4/

28. Oil development always carries with it the risk of catastrophic accidents. Both have occurred in Ecuador and Alaska and have severely affected both the subsistence and cash economies of indigenous peoples for which they received no compensation. In 1987 an earthquake ruptured the TransEcuadorian Pipeline spilling 6 million gallons of oil into the watersheds of the Quito, Coca, Aquarico and Napo Rivers. While under Texaco's management, 30 major spills occurred amounting to 16.8 million gallons of oil. There is no remedy for these spills; the ruptured part of the pipeline is merely emptied out and repaired. On 24 March 1989, the Exxon-Valdez hit Bligh Reef and spilled 11 million gallons of oil into Prince William Sound (Alaska). In the absence of an effective corporate emergency plan, an emergency team, emergency equipment and sufficient dispersants, it took Alyeska Pipeline Service Company 35 hours to fully encircle the stricken tanker and by that time it had lost control of the spill and fouled 1,200 miles of coastline. Alyeska is owned by British Petroleum, Atlantic Richfield, Exxon, Amerada Hess, Mobil, Phillips Petroleum and UNOCAL. 5/

29. Two years later the United States Government reported that the number of otters, seals, bald eagles, sea birds and other once-abundant animals had plummeted and would not recover for years. Losses include killer whales, extensive reproductive defects in salmon and herrings, widespread and lingering damage to sea-grasses and other tidal zones; 350,000-390,000 sea-birds died and colonies of one of the most abundant species, the common and thick-billed murres, lost 60-70 per cent of breeding birds. About 10,000 of the sea otters died, one third of the total number. The habitat most heavily damaged by the oil spill was the shoreline and shallow areas along the western boundaries of Prince William Sound. Two years after the spill native fishing and gathering both on a subsistence and commercial scale remain disrupted. Data for subsistence activity in English Bay and Cook Inlet indicates that the shoreline provides 90 per cent. Food gathered includes seaweed, clams, shrimp, cockles, octopus, mussels, seal and limpets. For weeks, tides washed oil in and out of bays, and up and down rocky shores, killing sea-grasses, clams, suffocating bay bottoms and playing havoc with almost all the living creatures in the region. The spill occurred just weeks before spring, when birds, mammals and fish species give birth. Pacific herring, larvae, mussels, clams and shellfish absorbed the hydrocarbons causing abnormal embryos and tumors, and they became a continuous source of poison to sea otters and other species which forage in the tidal zones. For example, the native village of Port Graham lost the bases of both its subsistence and commercial economy. Salmon fishing was abandoned when fish showed up with oil on their scales and in their gills. The Port Graham Cannery has been closed for two seasons costing 70 jobs. 6/

30. The United States federal and State Governments collectively sued Exxon Corporation for $1.1 billion which covers only their costs of clean-up, some loss of resources and scientific and economic studies. Local Alaskan Natives - those most affected by the accident - were locked out of the negotiations between Exxon, the State of Alaska and the federal Government. Most likely estimates of damage are between $2.5-$5 billion from the time of the spill until 1994. The settlement was temporarily blocked by a federal judge until he was assured that 5,000 Alaskan Native villagers would not lose their right to gain financial damages.

31. Respondents from Alaska and Costa Rica stressed the socio-cultural effects of a large influx of petroleum workers, ranging from increased hunting of local wildlife to the spread of drug trafficking. Inupiat underscored the "demonstration effect" of the presence of thousands of relatively wealthy outsiders on indigenous peoples who have lost their means of subsistence. Indigenous peoples feel even more impoverished and powerless in the face of such wealth, and fall victim to extremely high rates of alcoholism and suicide.

32. Many indigenous peoples have been adversely affected by hard-rock mining. Mining spoils can be highly toxic, especially from uranium or lead-zinc ores. If not secured, spoils leach heavy metals into groundwater and streams, or are windblown over a wide area. In addition, an opencast mine destroys surface landforms and vegetation, and disrupts underground aquifers. Filling, shaping and revegetating old opencast mines is expensive, and operators will avoid this cost if permitted to do so. When Kerr-McGee closed its uranium mine on Navajo reservation land, for example, it left 71 acres (177 hectares) of radioactive ore spoils near the banks of the San Juan River, reportedly resulting in a sharp increase in downstream frequencies of cancer and birth defects. 7/ Stabilizing the radioactive spoils left by the Anaconda uranium opencast mine at Laguna Pueblo will cost more than $40 million, more than the benefits the community has received from employment and royalties. Uranium mining has also contaminated wildlife, fish and water used by indigenous people in the Lake Athabasca area of northern Saskatchewan. Firms involved in uranium exploration in northern Canada include TNCs with German (Uranerz, Urangesellschaft), French (Seru Nuclear/COGEMA) and Japanese (PNC Exploration/Power Reactor of Japan) parentage.

33. The Comarca Guaymi reported problems with erosion, reduced water quality, depletion of fish and wildlife, and poor health as results of copper mining by Minero Cerro Colorado, a Panamanian parastatal which is associated with Texas Gulf (United States) and Rio Tinto Zinc (United Kingdom). There are reports of stream contamination from the Red Dog lead-zinc mine in north-west Alaska, operated by COMINCO (Canada) under lease with NANA, an indigenous regional corporation. Sealaska reported concerns over the impact on subsistence resources of its mining leases with Echo Bay Mines (IU International, United States), American Copper & Nickel and Kennecott Mining. Concerns about possible effects of gold mining were expressed by the Asociación Cultural Sejekto, and the Movimiento de la Juventud Kuna.

34. Opencast mining (or "strip-mining") of coal involves the removal of very large amounts of overlaying soils and rock (or "overburden"). Since coals are found layered between porous sedimentary rocks, there is also a particularly high risk of contaminating or diverting groundwater supplies. Coal-processing demands large quantities of water as well. One of the largest coal-stripping operations in the world is on the Navajo reservation, operated by Peabody Coal Co. (United Kingdom), the Pittsburgh & Midway Coal Company, and Utah International. About 13 million tonnes of coal were removed in 1989, 8/ under long-term leases with the Navajo tribe. Although the mining companies reportedly comply with national mining reclamation laws, the Navajos report problems with erosion and desertification, and a coal slurry pipeline damaging the pure water aquifers. Comparisons may be made with the El Cerrejón coal project in north-eastern Colombia, a joint venture of a Colombian parastatal (Carbocol) and Exxon (United States). 9/ Lowering of the water table may become an increasing problem in this relatively arid, largely indigenous area.

35. Logging destroys habitat for some wildlife species and can result in erosion, flooding, reduced water quality, and damage to fisheries. While logging itself leaves few toxic materials in the environment, it impacts a much larger area than mining activities, and involves a much larger temporary workforce. Mills for the production of lumber, pulp and paper utilize extremely toxic materials, moreover. Preservatives used in lumber finishing contain dioxin and other carcinogens, and the processes used to digest pulp and bleach paper involve powerful acids and oxidants that can kill fish and vegetation. Several large bays on Canada's Pacific coast were closed to commercial shellfish harvesting last year due to the accumulation of contamination from pulp and paper mills. Indigenous people were advised to reduce their consumption of shellfish, which will have a severe adverse impact on food security.

36. Although recent public attention has focused on tropical forests in South-East Asia and Amazonia, logging is also threatening the subsistence of indigenous peoples in temperate and boreal forests. In the United States, for example, the Chehalis and Coos-Umpqua reported that extensive logging since the 1920s by TNCs (including Weyerhaeuser Corp., ITT Rayonier and Georgia Pacific) has adversely affected their food fisheries. Similarly, the Consejo de Todas las Tierras reported that the extensive clearcutting of primary hardwood forests in central Chile (Valdivia province) by Bomasa (Japan) was destroying the Mapuche traditional economy and culture. Logging of teak and other hardwoods along the border between Myanmar and Thailand is reportedly having an adverse effect on the subsistence of the Karen people.

37. Indigenous people find they have no choice but to seek employment with the same logging companies that are destroying their subsistence resources. Eventually, however, unsustainable logging practices will lead to the loss of these jobs as well. The Coos, for example, report that one third of their families now depend on logging jobs with TNCs. Harvests are now being scaled back for environmental reasons, leaving the Coos with no economic alternatives. The Colvilles report that the forest-products companies surrounding their lands discriminate against indigenous workers. Similarly, the Mapuche people employed in Chile's logging industry are not organized and reportedly receive lower wages than non-indigenous workers. Myanmar does not allow unions, and Karen report that TNCs mostly import their own labour.

38. Some of the most dramatic disruptions of indigenous societies have been associated with the development of hydroelectric power. This problem has a long history. The Colvilles report that they were "devastated" economically and culturally by the construction of the Grand Coulee Dam in 1939. They were forced to shift their economy from salmon fishing to logging and tourism. Thousands more indigenous people were forced to abandon their homes and farms in the midwestern United States by power and reclamation dams built in the 1950s. 10/ In the 1960s, hydroelectric projects were urged on developing countries as a means of stimulating industrialization, and liberal financing was made available by United Nations agencies (UNDP), the World Bank and bilateral donors such as USAID. Several million people have been displaced by these projects thus far, including hundreds of thousands of tribal people in India and Brazil. 11/ A small number of specialized TNCs such as the Bechtel Corp. have been major beneficiaries of this construction boom. Liberal

financing was made available by the World Bank and other multilateral and bilateral donors. It has been estimated that dams built or planned since 1970 will displace over 2 million people. 12/

39. Unlike dams in the United States and Europe, this new generation of projects has generally been designed or equipped by foreign TNCs. For example, Brazil's Itaipu Dam was designed by Morrison-Knudsen Co. (United States) and Electroconsult (Italy), and its turbines were built by Voithhydro (United States). Itaipu flooded 1,400 sq. km affecting 40,000-50,000 people including several hundred families of Paraguayan Guarani and Chiripa Indians. 13/ In other cases, hydroelectric projects are financed indirectly through long-term power supply contracts with TNCs. The Grande Carajas Programme in north-eastern Brazil, which includes the Tacurui Dam, incorporates two aluminium mining and smeltering projects, one of them a joint venture of ALCOA (United States) and Royal Dutch Shell (Netherlands), the other by a consortium of Japanese companies known as Nippon Amazon Aluminium Co. 14/ Canada's James Bay project is linked to supply contracts with United States and Norwegian smelters.

40. The principal impacts of hydroelectric projects are inundation of upstream lands, drying and sporadic flooding of downstream lands, and obstructing the passage of fish. Until the 1950s, dams were built in narrow valleys or canyons with steep inclines, resulting in relatively small, deep reservoirs. With improvements in engineering and growing demand for hydroelectric projects in all countries, more dams are now built in relatively flat terrain. This requires extensive diking and the diversion of several rivers, resulting in a very large but shallow reservoir. The amount of land inundated is far greater for each unit of electrical power generated. The James Bay project in Quebec will require three times as much total storage, and inundate more than five times as much land as the 50-year-old Bonneville Power system on the Columbia River in the United States, which includes Grand Coulee Dam (see case study No. 3).

41. Aquaculture is not usually regarded as a major industry, or as an environmentally disruptive one. It is increasingly transnationalized, however, and appears to be a concern for indigenous peoples who depend on marine resources. The Chehalis fear that commercial salmon-rearing operations, engineered by Weyerhaeuser Corp. and one or more Norwegian firms, will have an adverse effect on wild salmon stocks. False Pass, located in the Aleutian Islands, reported that commercial aquaculture facilities operated by Peter Pan Seafoods (Japan) had adverse effects on water quality and fisheries. Aquaculture shares many features with monocultural agriculture. It employs genetically pure strains, which have little resistance to new diseases or opportunistic predators, and relies on the intensive use of chemical inputs (hormones, antibiotics, herbicides) which accumulate in the environment. In "sea-ranching" or release-recapture facilities, cultivated fish are released into marine environments where they compete for food with wild stocks.

42. Two of the respondents (Kuna, Guaymi) referred to the employment of indigenous people on plantations operated by the United Fruit Co., a United States-based TNC. Additional information on the extent of plantation

development in indigenous territories, and conditions of employment of indigenous people in this sector, would be useful. The International Labour Organisation has responded to complaints of forced recruitment, bonded labour, unsafe working conditions, and low wages for indigenous workers on plantations in Guatemala, Bolivia, and elsewhere in Latin America and Asia. 15/

E. Indigenous participation

43. A major objective of this study was to determine the significance of indigenous participation in the initiation, management and benefits of projects, especially with respect to the mitigation of any possible adverse environmental impacts. Articles 7 and 15 of the International Labour Organisation's "Convention on Indigenous and Tribal Peoples in Independent Countries", No. 169 (1989), which will come into force on 5 September 1991, recognizes the rights of indigenous peoples to control their own development and manage their own natural resources. In some countries, such as the United States, indigenous peoples have managed development projects on their lands for many years. One part of the UNCTC questionnaire accordingly sought detailed information on participation and its perceived benefits.

44. Respondents from the United States reported that they control the management and commercial harvesting of their own forests (Mississippi Choctaw, Kalispel, Lummi, Port Gamble, Turtle Mountain). United States Indian reservations contain about 16 million acres (6.4 million hectares) of forest lands, and annual forest production from all United States reservations is currently about 850 MMBF with a value of $800 million. United States Indian tribes have also been increasing their role in mineral exploration and development on reservation lands. Annual mineral production from United States reservation lands averages $1 billion yearly, and about 12 per cent of this is returned to the tribes as royalties. Nearly half of the total is coal, followed by oil and gas. A few reservations produce uranium. 16/

45. Different kinds of arrangements for indigenous participation were described by respondents to the questionnaire, ranging from leasing of resource-extraction rights to full tribal ownership and management of production facilities. There were an insufficient number of responses to draw any conclusions about the comparative merits of each approach. In most cases, however, participation was associated with a perception on the part of the people concerned that adverse impacts have been low or absent. Some examples follow.

46. Leasing is still the dominant production arrangement for mining. The Navajo Nation, for example, leases coal and petroleum to 11 TNCs, 17/ and conducts its own safety and health inspections of facilities. The Navajos collected $43 million in royalties and taxes from these leases in 1987. Leases contain commitments to employ indigenous people, and it was reported that 80 per cent of the coalmining workforce and 30 per cent of the petroleum workforce are currently Navajo. The Navajo Nation also has its own environmental protection agency and developed its regulation in advance of the United States. While it has been late to capture the economic returns from mining it has been able to limit environmental damage. An exception might be

uranium mining which occurred many years ago, before its hazards were known. The Navajo Nation also leases the site of a General Dynamics electronics assembly factory which has a 95 per cent Navajo workforce. Other examples from responses to the UNCTC questionnaire include a gypsum mine leased by Zia Pueblo to Centex American Gypsum, and exploration rights for gold, lead and zinc leased by Sealaska to United States and British-based TNCs.

47. Joint ventures have increased over the past decade as a strategy for increasing indigenous peoples' share of management and employment. The Mississippi Choctaw described a joint venture with Oxford Speaker Co. assembling electronic components, and the Crees of Quebec operate a fibreglass boat-building enterprise as a joint venture with Yamaha Motors (Japan). Fort Peck is in the process of converting petroleum leases with TNCs into joint ventures with smaller domestic companies, with the aim of strengthening environmental supervision.

48. Tribal ownership is the principal form of production arrangement in the United States, outside of the mining sector. A tribally owned aluminum-parts manufacturing plant employs one third of the Kalispel workforce, for example, and Turtle Mountain owns a metal-fabrication plant which employs 155 tribal members. The Chickasaw Nation owns a machine-tool factory and construction company. The Crees of Quebec own a regional airline (Air Creebec), which has gross revenues of $Can 30 million. The Colvilles and Navajo Nation own and operate sawmills, designed to increase the value-added to their forest harvests, and in the Pacific Northwest, indigenous communities are building commercial aquaculture and mariculture facilities. Swinomish fisheries and aquaculture yield $3.5 million yearly. Tribally owned enterprises can be found in other sectors as well, including tourism (Chickasaw, Colville) and financial services (Sealaska).

49. The attitude of many indigenous respondents was stated succinctly by the Colvilles: "We now realize that no one else is going to help, so we have to start helping ourselves." A similar view was expressed by the Movimiento de la Juventud Kuna, which is organizing Kuna youth into farming and fishing cooperatives. Even educated Kuna experience severe discrimination in Panamanian society, it was explained, making it essential to provide employment within Kuna society.

50. It should be noted that few workers on United States Indian reservations are members of trade unions. With the exception of the Navajo, which has a largely unionized mining industry, most United States respondents indicated that the interests of workers are promoted by Tribal Employee Rights Organizations (TEROs), which are agencies of indigenous peoples' own local governments. By comparison, it was generally reported that off-reservation workers belong to the same trade unions as non-indigenous workers, although employment discrimination continues to be a problem.

51. As their economic structures change, indigenous communities may become increasingly differentiated in social and economic terms. When this has occurred, the question of participation becomes more complex. In the case of the Red Dog Mine, for example, indigenous people participate directly in management through NANA Corp., a joint venture partner with COMINCO (see case study No. 3). Other members of the same indigenous community, especially

those who still rely on hunting and fishing for their food, feel that their interests have been disregarded by NANA. Unsuccessful non-participatory "development" activities will make indigenous people in the affected area equally poor. Participatory projects may succeed only in making a small proportion of the community relatively wealthy. This kind of differential impact can be avoided when indigenous people have genuinely representative institutions of their own, and projects are negotiated directly with these institutions.

F. Transnational linkages

52. Insufficient information has been collected thus far to describe characteristic patterns of TNCs' conduct in indigenous territories in much detail with the exception of the oil industry. It is evident, however, that United States-based TNCs pay greater attention to environmental protection when operating on lands owned by indigenous peoples in the United States where they are regulated by federal, State and sometimes tribal regulations. The Navajo Nation reports few environmental impacts from operations of the same TNCs in its territory under lease arrangements. The implication of this is that indigenous participation is a significant factor in TNCs' environmental performance.

53. A useful comparison can also be made between the United States, Canada and Australia. 16/ Indigenous (Aboriginal) Australians currently have title to less than 10 per cent of the national territory, chiefly in South Australia and the Northern Territories, and comprise a little more than 1 per cent of the national population. Seven major mining projects were located on or near Aboriginal lands in 1984-1985, with a total production of $960 million. They included the country's only bauxite exporters, its only uranium exporters, its only large-scale diamond producer, and its only manganese mine (accounting for about 10 per cent of world production). Aboriginal employment in these operations is less than 10 per cent, and royalties are only paid in the Northern Territories, where Aboriginal lands include subsurface rights.

54. Some TNCs operating mines on or near Aboriginal lands have had past experience with indigenous peoples in North America. The Groote Eylandt manganese mine is operated by BHP (Utah International), which also produces coal under lease from the Navajo Nation. A bauxite project in Queensland (Arukun) is shared by ELF-Aquitaine (France) and Shell (United Kingdom and Netherlands). Shell has operated a coalmine under lease from the Crow Indian tribe in the United States. The Roxby Downs uranium project is operated by BP/Kennecott (United Kingdom), which leases exploration rights in Alaska from Sealaska.

55. Experience negotiating with indigenous communities in the United States does not ensure that TNCs will be sensitive to the concerns of indigenous peoples elsewhere, however. AMAX (United States) had operated coalmines on the Crow reservation under lease, but became the centre of a storm of Aboriginal protest in 1979 when it bulldozed a sacred site at Noonkanbah, Western Australia, in the course of petroleum exploration. (Chevron, a major shareholder in AMAX, also operates a coalmine under lease from the Navajo Nation.) On the other hand, some TNCs have had poor records in both countries.

The Gove bauxite mine in the Northern Territories is operated by Alusuisse (Switzerland) and a subsidiary of Rio Tinto Zinc (United Kingdom), which built the controversial Churchill Falls hydroelectric project in Labrador on land still occupied and claimed by indigenous peoples. The critical difference in TNC performance, in these cases, appears to be the legal status of indigenous lands rather than corporate policy or corporate culture.

56. Indigenous peoples in the United States and parts of Canada have been able to insist on participating in TNC activities because they have secure land and resource rights. In contrast, the indigenous territories in Ecuador, Panama and Chile which have been adversely impacted by mining and logging are treated as part of the national estate, and indigenous peoples have no legally protected rights to prevent their use. In the case of Colombia's El Cerrejón coal project, land was expropriated by the State with the payment of compensation, but most of the indigenous people displaced by the project were unable to find employment in the mines or elsewhere. In Latin America and those parts of Australia and Canada that are still in dispute, indigenous peoples maintain that no concessions should be made to TNCs until after all land claims have been resolved, and all indigenous lands have been demarcated.

G. Directions for future work

57. It is essential to expand the geographical coverage of the UNCTC database. Priority will be given in next year's report to Africa, South-East Asia and the Pacific. There is also a need for more systematic data, for each country and each economic sector, on the physical scale and approximate value of TNC activities.

58. The third report will explore further the relationships between TNCs' performance and the legal status of indigenous peoples and their lands. This will require more information on the identities of major TNCs operating in each country, as well as more detailed assessments, by indigenous people themselves, of the extent to which their concerns were taken into account in project planning and execution.

59. In preparing its third report, UNCTC will intensify its efforts to obtain baseline information from a more complete and representative sample of indigenous peoples in all countries. This will involve the distribution of a second survey questionnaire, revised on the basis of experience gained from responses to the first. Telephone contact will be made, as far as possible, with larger indigenous organizations in each country. In addition, UNCTC will seek more detailed information on impact assessment and participation from those organizations which responded to the first survey. Undoubtedly the quality of the responses could be improved if the questionnaire were administered directly rather than through the mail. However, site visits could be very costly. Detailed case studies will be written given sufficient time and resources.

60. UNCTC is in the process of computerizing responses received thus far using the software (PARADOX) that permits keyword searches. This will enable users to locate information by categories used in the questionnaire itself, or any words or phrases used by the respondents. A disk version of

the UNCTC database will be updated annually, and made available on request to participants in the study and to the United Nations system. This service, however, will require additional resources.

61. The greatest strength of this study can be its use of assessments made by indigenous peoples themselves, and this could be strengthened in the future. Only two organizations contacted expressed reluctance to participate in this study for reasons of confidentiality, and none questioned the usefulness of the study. Many others, however, chiefly in Latin America, indicated that they lacked the technical capability to provide the information requested. Several of them suggested that technical assistance be provided for this purpose. UNCTC will explore means of providing technical assistance and training in environmental monitoring to indigenous organizations, possibly through cooperative agreements with indigenous organizations in other countries.

62. In some cases, respondents to the first survey reported problems obtaining information from TNCs and government agencies. It is hoped that indigenous organizations participating in this study will enjoy the full cooperation of all parties.

63. It is essential that this report be given the widest possible distribution among Governments and United Nations operational bodies and agencies, for verification and supplementation of the information reported.

Notes

1/ E.g., Tribal peoples and Economic Development (World Bank, 1982); "The Rights of Indigenous Peoples", United Nations World Campaign for Human Rights, Fact Sheet No. 9 (Geneva, 1990).

2/ Dietary change in the Canadian is reviewed in detail in Seals and Sealing in Canada. Report of the Royal Commission (Ottawa: Minister of Supply and Services, 1986).

3/ United States Fish and Wildlife Service, "Comparison of Actual and Predicted Impacts of the Trans-Alaska Pipeline System and Prudhoe Bay Oilfields on the North Slope of Alaska", Fairbanks, Alaska, December 1987 transcript, released May 1988.

4/ J. Kimerling, Amazon Crude (Natural Resources Defense Council, New York, 1991).

5/ J. Kimerling, Amazon Crude (Natural Resources Defense Council, New York, 1991).

6/ New York Times, 24 March 1991, p. 28.

7/ For case studies of mining, see J. Jorgenson (ed.), Native Americans and Energy Development (Cambridge, MA: Anthropology Resource Center, 1986); J. Harding, "Indigenous rights and uranium mining in northern Saskatchewan", in IWGIA Document No. 62 (1988-89); and W. Churchill and W. LaDuke, "Native America: The political economy of radioactive colonialism", in IWGIA Document No. 68 (1991).

8/ United States Department of the Interior, Mineral Management, Mineral Revenues 1980-89 (1989).

9/ J. Jonish, "Social and economic effects of El Cerrejon coal project in Colombia", International Labour Organisation, Sectoral Activities Programme, Working Paper SAP.2.5/WP.8 (1987).

10/ M. Lawson, Dammed Indians. The Pick-Slogan Plan and the Missouri River Sioux, 1944-1980 (University of Oklahoma Press, 1982).

11/ M. Cernea, "Internal refugees and development-caused population displacement", Harvard University Development Discussion Paper No. 345 (June 1990).

12/ International Labour Office, Report of the Committee of Experts on the application of standards, 75th session (1988), p. 285.

13/ P. Aspelin and S. Coelho Dos Santos, "Indian areas threatened by hydroelectric projects in Brazil", in IWGIA Document No. 44 (1981).

14/ A. Hall, "Agrarian crisis in Brazilian Amazonia: The Grande Carajas Programme", Journal of Development Studies, 23:522-552 (1987).

15/ International Labour Office, Partial revision of the Indigenous and Tribal Populations Convention 1957 (No. 107), Report VI (1) (1988), at pp. 76-88.

16/ United States Department of the Interior, Bureau of Indian Affairs, Forest Reports (1989).

17/ Amoco, ARCO, BHP (Australia), Chevron, El Paso Natural Gas, Kerr-McGee, Mobil, Peabody Coal (United Kingdom/South Africa), Phillips, Texaco, and UNOCAL. All have United States parents except as indicated.

18/ S. McGill and G. Crough, "Indigenous Resource Rights and Mining Companies in North America and Australia", Natural Resources Forum 11 (1):5-26 (1987); D. Cousins and J. Nieuwenhuysen, Aboriginals and the Mining Industry (Sydney: George, Allen & Unwin, 1984).

Annex

CASE HISTORIES

1. Petroleum and the Ecuadorian Amazon

1. For the past 20 years, the economy of Ecuador has been driven by Amazonian petroleum. TNCs have obtained concessions to more than 4.6 million hectares, or nearly one third of the entire Ecuadorian Amazon, and are negotiating for an additional 600,000 hectares. Revenues from 300 producing wells pay for 40 per cent of the national budget, and the dependence of the public sector on this income, combined with pressure to repay Ecuador's external debt (102 per cent of GNP), have encouraged the State to accelerate exploration and production. Texaco (United States) has been the major beneficiary of this policy. Large concessions are also held by ARCO, Braspetro, Britoil, Conoco, Elf-Aquitaine, British Petroleum, Occidental Exploration and Production Company, Oryx, Petrobras, PetroCanada and Unocal.

2. Indigenous peoples account for about one third of the population of the Ecuadorian Amazon. The Huaorani, numbering 900-1,200, are one of the most independent and traditional of these peoples, still living by shifting horticulture, fishing, and hunting with blowguns and poisoned darts. The largest group of Huaorani are settled at the headwaters of the Curaray River, on a 66,000-hectare "protectorate" secured to them since 1983. Smaller, relatively isolated Huaorani groups live farther north, near the Napo River. Part of this northern Huaorani territory was incorporated in 1979 into Yasuni National Park, a UNESCO Biosphere Reserve. Under Ecuadorian law, indigenous peoples have limited rights to hunt and gather in parks, but have no right to obtain title to land they do not cultivate.

3. Conoco, a subsidiary of DuPont, subsequently obtained exploration rights to 200,000 hectares including part of the Yasuni National Park and lands occupied by the Huaorani. CORDAVI, an Ecuadorian environmental-defence group, successfully challenged the legality of this concession in the Tribunal of Constitutional Guarantees, Ecuador's constitutional court. The Tribunal, after initially directing the Government not to award concessions in protected areas, reversed itself and instead directed the Government to safeguard the constitutional right to a pollution-free environment.

4. Petroleum development elsewhere in Amazonian Ecuador already has had a destructive impact on other indigenous groups such as the Cofan, whose lands have been so reduced by oil wells, roads and colonists that they can no longer make a sustainable living from it. They have grown dependent on selling handicrafts, and on selling what remains of their forest and wildlife.

5. Every stage of petroleum development has been costly to Ecuador's people and environment. Seismic exploration begins with construction of a network of access roads and heliports. Test wells require larger clearings, and produce drilling muds which contain toxic heavy metals and aromatic hydrocarbons. Producing wells are pressurized with fresh water, which turns into a toxic "brine". TNCs in Ecuador have had a poor record for disposal of muds and brine, and there have been a large number of spills from waste pits, while an estimated 17 million gallons of oil have spilled from poorly maintained

pipelines. Burning waste oil produces toxic soot and acidifies lakes and streams, adding to the destruction of wildlife and fisheries, and to the deterioration of indigenous peoples' food supplies and health. Access roads attract loggers and colonists, drug abuse, prostitution and disease.

6. Ecuador's oil boom will be short-lived, as known reserves will be exhausted in 15 years. The adverse impacts on indigenous peoples, and on the sustainable productivity of the forest, are irreversible.

Sources: J. Hicks et al., Equador's Amazon Region: Development Issues and Options, The World Bank Discussion Papers, No.75 (Washington, 1990); J. Kimerling, Amazon Crude, (Natural Resources Defense Council, New York, 1990); Sierra Club Legal Defense Fund.

2. Hydroelectric development in Quebec (Canada)

1. In 1970, the province of Quebec announced a 30-year plan to build a series of hydroelectric dams on the rivers emptying into James Bay, with a total generating capacity of 20,800 MW. The area affected was still occupied almost exclusively by 10,000 Crees and 1,500 Inuit, who were subsisting by hunting, fishing and trapping. The Cree took legal action to block construction, and the Government agreed to negotiate a general settlement of Cree claims. Under the 1975 James Bay Agreement the Crees obtained legal title to about 15 per cent of their territory, and $(Can) 225 million in compensation. The Crees also retained their right to continue to hunt, fish and trap throughout the region.

2. The first stage of the James Bay project was completed in 1986 at a cost of more than $(Can) 16 billion to Hydro-Quebec, a parastatal of the Quebec provincial government. Three rivers were diverted into La Grande River, inundating 3,675 sq. km of forest and tundra. While the diverted rivers lost up to 90 per cent of their natural flows, the flow of La Grande River doubled. Since demand for electrical power is greatest in winter, Hydro-Quebec stores water in summer, reversing the natural seasonal cycle of flow levels. This interferes with migration and spawning of freshwater fish, and dessicates the estuarine wetlands used for feeding by migrating waterfowl. Augmented winter flows have also increased riverbank erosion, and reportedly resulted in drowning thousands of migrating caribou. Access roads built for construction crews are now being used by loggers and recreational hunters, further undermining the traditional Cree food system. Decaying plant material in the reservoirs has moreover resulted in the release of mercury into the food chain. Freshwater fish, a large part of the traditional Cree diet, have become unsafe to eat, and by 1984 two thirds of the Crees already had mercury levels in excess of levels considered safe by the World Health Organization.

3. Construction of the La Grande complex also brought 4,000 workers into Cree territory, temporarily increasing pressure on local wildlife and, according to community leaders, spreading drug abuse and sexually transmitted diseases. In the wake of these stresses, Crees and Inuit have reported dietary deficiencies, poor health, increased alcohol and drug abuse, and a growing problem of family violence.

4. The Crees and Inuit are now opposing the second and third stages of the hydroelectric project. The second stage involves the diversion of the Little Whale and Boutin Rivers into Great Whale River, flooding 865 sq. km of river valley lands, including areas which are used by caribou for breeding. The third stage involves diverting the Rupert, Broadback, and Nottoway Rivers and inundating another 3,620 sq. km, including wetlands considered essential as feeding areas for migrating waterfowl. The total cost of these project expansions is estimated to be nearly $(Can) 30 billion over the next 15 years.

5. Continued expansion of the James Bay complex is tied to plans for the export of electrical power to the United States. Hydro-Quebec has already entered into a 20-year, $(Can) 20 billion contract to provide power to New York. Hydro-Quebec is also offering low-cost power as an incentive for aluminium and magnesium smelters to relocate to Quebec or expand their

existing Quebec operations. Reynolds Aluminium (United States) and Norsk-Hydro (Norway) have reportedly made agreements with Quebec-Hydro for James Bay power, but a Quebec court has blocked publication of the names of all of the TNCs with which Hydro-Quebec has negotiated power contracts. Although a federal Government environmental assessment has been promised, Hydro-Quebec is proceeding with construction of access roads and airports without awaiting its results.

Sources: Grand Council of the Crees of Quebec; F. Berkes, "Impacts of James Bay development", C.E. Delisle and M.A. Bouchard (eds.), pp. 624-636 in Collection Environment Aet Geologie, vol. 9 (1990); J. Beyea, J. Rosenthal and J. Hansell, "Long-term threats to Canada's James Bay from hydroelectric development", Information North, 16 (3):1-8 (September, 1990); P. Gorrie, "The James Bay Power Project", Canadian Geographic (February-March 1990), pp. 21-9; M. Lipske, "Playing for power", International Wildlife, (May-June, 1991); A. Penn, "River diversion in northern Quebec: learning from the La Grande Complex", 153-68 in Proceeding of the symposium on interbasin transfer of water: impacts and research needs for Canada, Saskatchewan (NHRI, 1987); "Power to burn", Maclean's 103 (21):50-7 (May 1990), and "James Bay development project", Canadian Water Watch, 3 (7-8):56-64 (July-August, 1990).

3. Alaska's Red Dog Mine (United States)

1. In 1971, the Alaska Native Claims Settlement Act (ANCSA) created 12 "Native Regional Corporations" to manage indigenous lands and land-claims compensation funds. In most respects, ANCSA corporations have the same structure as private business corporations, and the same legal status. For 20 years, however, their shares could only be owned by indigenous Alaskans.

2. NANA is the ANCSA regional corporation for the north-western part of Alaska. Its 4,900 indigenous shareholders live mostly in 12 small rural villages, and support themselves by hunting, fishing and part-time wage employment when it is available. NANA's organizers adopted a philosophy of instilling pride and confidence in the shareholders, and protecting the living resources of the Arctic on which they have traditionally relied for their subsistence. Although NANA held title under ANCSA to lands with rich deposits of lead, zinc and silver ores, it delayed development out of concern for the environment.

3. Problems arose, however, as NANA shareholders became accustomed to living in centralized villages with government-supplied, American-style houses and electrical appliances. Most had to accept transfer payments to obtain the cash needed to maintain their new way of life. Alcoholism and suicides increased dramatically. Faced with increased dependence on the market economy and limited employment opportunities, NANA's shareholders voted in 1982 to lease their mineral property to COMINCO (Canada).

4. NANA will begin to share in the profits of the mine once COMINCO has recovered its capital investment. NANA's share will begin at 25 per cent, and increase by 5 per cent each year, up to 50 per cent. After 12 years, the mine will be operated exclusively by indigenous people, trained under a programme partly funded by the national Government. Nearly half the workforce was already indigenous in 1991.

5. The Red Dog Mine is now one of the largest lead-zinc producers in the world, and contains 29 per cent of all proven United States zinc reserves. An opencast operation, it will reach full capacity next year at 2.1 million tons of ore removed annually. COMINCO's development cost has been approximately $415 million, including lease payments to NANA.

6. The environmental problems originally feared by NANA shareholders appeared within a year after mining operations began. In August 1990, heavy metal loads in nearby Red Dog Creek were 200 times safe levels, and the water was orange-coloured. Kivalina, an indigenous village 60 miles (96 km) downstream, relies on the creek for fishing and drinking water. Several residents were tested and found to have abnormal lead levels in their blood. Point Hope, another nearby village, fears that waste pits will overflow during spring melting, contaminating streams and wildlife. COMINCO maintains that its programme of monitoring and water treatment will meet "zero-discharge" targets.

7. For the indigenous people who are managers and employees of NANA, the Red Dog Mine is a source of great pride, an enterprise of global significance that they helped build, and largely control themselves. For some other indigenous people in north-western Alaska, the mine is a threat to their health and their traditional way of life. Indigenous participation in the design and management of the mine may have helped ensure a relatively high level of environmental care, but it has also internalized the environmental debate within the indigenous community.

Sources: Native Village of Point Hope questionnaire.

MAP 1. Locations of respondents to the UNCTC questionnaire (North America)

MAP 2. Indigenous lands and distinct indigenous areas in North America

MAP 3. Indigenous land claims areas and areas remaining under claim (Canada)

MAP 4. Indigenous lands and distinct indigenous areas in South America

MAP 5. Major mineral deposits on indigenous lands or in distinct indigneous areas of North America (black = coal, petroleum; stars = silver, gold or platinum; squares = iron, lead, zinc, or copper; arrows = uranium).
Outlines show full extent of principal hydrocarbon fields.

MAP 6. Major mineral deposits on indigenous lands or in distinct indigenous areas of South America (black ovals = coal, petroleum; stars = silver, gold or platinum; squares = iron, lead, zinc, copper; triangles = tin; arrows = uranium)

MAP 7. Major boreal forests, temperate rainforests, and tropical rainforests of North America (rainforests indicated with cross-hatching)

MAP 8. Major rainforests of South America (rainforests indicated with cross-hatching)